

Patent Claims

1. A measuring device (7, 13, 14, 15, 32) for measuring changes in at least one position of at least one body edge (5a) of a component (1, 3), the measuring device having at least one sensor (9) reacting to the changes, characterized in that the measuring device (7, 13, 14, 15, 32) has at least one light source (8), at least one measuring edge (5) that is fixed in relation to the body edge (5a), and at least one light (6) emanating from the light source (8), it being possible for the measuring edge (5) to vary its position by comparison with the light (6) at least from an initial position, and a portion (6a) of the light (6) that has been changed in size by changes in the position by comparison with the initial position of the measuring edge(s) strikes the sensor (9) without impediment.

2. The measuring device as claimed in claim 1, characterized in that the measuring edge (5) is the body edge (5a).

3. The measuring device as claimed in claim 2, characterized in that the body edge (5a) delimits a variable passage (4, 37, 38, 39, 40) that passes through the component (1, 3) and through which the portion of the light (6) strikes the sensor (9).

4. The measuring device as claimed in claim 1, characterized in that in the position of the measuring edge (5) varied from the initial position by comparison with the light (6) at the same time:

- a first portion of the light (6a) strikes the sensor (9) without impediment,
and
- at least one second portion (6b) of the light (6) strikes at least the measuring edge (5),

and it being possible for the first portion (6a) and the second portion (6b) of the light (6) to be changed in size relative to one another by changes in the position of the

measuring edge (5) from the initial position.

5. The measuring device as claimed in claim 4, characterized in that in the position of the measuring edge (5) varied from the initial position by comparison with the light (6) at the same time:

- at least two of the second portions (6b) of the light (6) respectively strike the measuring edge (5) at another location,

it being possible for the first portion (6a) and at least one of the second portions (6b) of the light (6) to be changed in size relative to one another by deviations in the position of the measuring edge (5) from the initial position.

6. The measuring device as claimed in claim 1, characterized in that the light source (8) and the sensor (9) are situated opposite one another and a portion (6b) of the light (6) strikes the measuring edge between the light source (8) and the sensor (9).

7. The measuring device as claimed in claim 1, characterized in that a reflector (33) is situated opposite the light source (8), the reflector (33) reflecting the light (6) at least intermittently and at least partially to the sensor (9), and the light (6) striking the measuring edge (5) at least partially between the light source (8) and the reflector (33).

8. The measuring device as claimed in claim 1, characterized in that the measuring device (13) has a first sensor (9) and at least a second sensor (17), and in the position varied from the initial position of the measuring edge (5) by comparison with the light (6) at the same time:

- a first portion (6a) of the light strikes the first sensor (9) without impediment and in this case,
- at least one second portion (6) of the light (6) strikes at least the measuring edge (5),

- the first portion (6a) and the second portion (6b) of the light (6) being changed in size relative to one another by deviations in the position of the measuring edge (5) from the initial position, and
- the first portion (6a) and the second portion (6b) of the light (6) striking the second sensor (17) at least partially in a fashion equaling the initial state in size and thus independently of the changes in the position.

9. The measuring device as claimed in claim 8, characterized in that the measuring device (13) has a control device (43), the control device (43) being connected to the second sensor (17) and the light source (8).

10. The measuring device as claimed in claim 1, characterized in that the measuring device (14) has at least one reference light source (23) with a reference light (44), the reference light (44) equaling at least the light (6a) in an initial position of the measuring edge (5), and in the position of the measuring edge (5) that has been changed relative to the initial position, at the same time:

- a first portion (6a) of the light (6) from the light source (8) strikes the sensor (9) without impediment,
- at least one second portion (6b) of the light (6) from the light source (8) strikes at least the measuring edge (5), and
- the first portion (6a) and the second portion (6b) are changed in size relative to one another by deviations in the position of the measuring edge (5) from the initial position, and
- the reference light (44), unchanged in comparison to the initial position, of the reference light source (23), strikes the sensor (9) in alternating sequence with the first portion (6a) of the light source (8), changed relative to the initial position.

11. The measuring device as claimed in claim 1, 8, 9 or 10, characterized in

that the measuring device (32) has at least one light guiding medium with the aid of which at least portions (6a, 6b) of the light (6) are guided into the measuring device (32).

12. The measuring device as claimed in claim 11, characterized in that the light guiding medium is in at least one fiber optics cable (34).

13. The measuring device as claimed in claim 1, characterized in that the component (1, 3) is assigned to at least one rotary and/or linear bearing (35).